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OSI - 3420
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10 May 1962

MEMORANDUM FOR : The Record

SUBJECT : Status - CXCART Engine Program

REFERENCE : (a) OIC-3437, dated 1 May 1962 titled
"Outstanding Items - Increased Scope
CXCART Engine Development Program"

(b) OIC-3383, dated 19 April 1962 titled
"Acceleration - CXCART Engine Altitude
Test Facilities"

1. This report summarizes significant highlights of subject program as surfaced during visits to Pratt & Whitney Hartford 24 April 1962, Hamilton-Standard 25 April 1962, and Pratt & Whitney Florida 4 May 1962.

2. Development Status:

Engine development is now in the phase of intensive ground endurance testing preparatory to flight qualification targeted for June 1962. Of the nine JT1D-20 development engines participating five are continuously on test with the other four being overhauled or inspected preparatory to further testing. Four 50 hour preliminary endurance tests have been completed, two of which were run in October 1961 and two in April 1962. A preliminary comparison of the tests run in April 1962 relative to those run in October 1961 as shown on Attachment 1 indicates significant progress in many areas including the following major critical problem areas:

- (a) Compressor durability.
- (b) Hydraulic pump durability.
- (c) Engine controls operation.
- (d) Combustion temperature distribution as it affects turbine durability.
- (e) Flushing durability.

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A notable exception to these improvements is afterburner durability which failed the test primarily because afterburner development testing has been heretofore precluded by combustion temperature maldistribution. With the improvement in this distribution, afterburner testing has been resumed and now is receiving the more intensive "cut and try" attack used previously to improve the temperature distribution.

In spite of the significant improvements cited above, further endurance test verification is required in order to establish initial Mach 2 limited flightworthiness. Further development and endurance testing is required on the hydraulic pump and engine controls as well as the afterburner in order to establish initial Mach 2 limited flightworthiness and test expeditiously in order to progress from the Mach 2 limited to the full Mach 3.2 environment. Fifty hour qualification tests at the full Mach 3.2 environment are scheduled in May 1962 for controls and the hydraulic pump and in June 1962 for the complete engine.

3. Development Acceleration:

Reference (a) and (b) memoranda summarize recent Development Branch actions taken to accelerate the development program in keeping with the top priority mandate received in February 1962. Since the release of reference (a) memorandum, changing conditions have dictated the authorization to the contractor to proceed on two additional items listed, namely, compressor test rig to engine interchangeability and the Mod IV turbine performance improvement.

4. Delivery Status:

Production delivery engines are on or slightly ahead of schedule at this time. The first engine (10-1) targeted for a 30 June 1962 delivery has passed the initial acceptance test and is now being reassembled for the final acceptance test. The second engine (10-2) targeted for a 31 July 1962 delivery has passed the initial acceptance test and is now undergoing teardown inspection prior to final assembly and test.

Engine controls and hydraulic pump deliveries are marginal because of manufacturing problems and the incorporation of engineering changes resulting from concurrent development and endurance test evaluation. That these items can remain compatible with engine assembly schedules

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is questionable, however, they are expected to improve during the summer. Other foreseeable potentially pacing areas affecting the fourth and subsequent delivery engines may be turbine blade and inner combustion case deliveries. Contractor corrective action is underway.

In order that there be no reduction in the controls delivery effort, Pratt & Whitney and Hamilton-Standard have been instructed to negotiate existing funding difficulties.

SIGNED

[Redacted Signature]

Development Branch
DPD

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cc: AFPCIG-5

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